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Engaging Research and Practice in Creating for Outdoor Multi-Sensory Environments: Facing future challenges

Hazreena Hussein^{a,*}, Nik Malik Nik Zainal Abidin^b, Zaliha Omar^c

^aUniversity of Malaya, Faculty of Built Environment, Department of Architecture, Kuala Lumpur 50603, Malaysia

^bMalik Lip and Associates, 26A, Persiaran Zaaba, Kuala Lumpur 60000, Malaysia

^cAl-Bukhary International University, Jalan Tun Razak, Alor Setar 05200, Malaysia

Abstract

This paper engages the users' behaviour, their perceptions of use in sensory gardens and the reality faced by practitioners designing for these gardens, based on case-studies in the UK. Further investigation will be undertaken at Al-Bukhary International University in Malaysia once the completion of the country's first sensory garden. Interview outcomes showed practitioners concurred on the design aspects that encourage the use of the area while the school staff had no strong views on the aesthetic value. Observation outcomes showed pathway layout encourages behaviour, use and time spent in sensory areas. These outcomes are a significant argument in the conclusion.

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1. Introduction

The material for this paper comes mainly from a PhD work, carried out in the United Kingdom. Following earlier research exploring the design and use of sensory gardens by Hussein (2009a), the researcher focuses her attention on the future challenges how research and practice could be engaged in creating for outdoor multi-sensory environments in both British and Malaysian context. 'A garden is a grand teacher. It teaches patience and careful watchfulness; it reaches industry and thrift; above all it teaches entire trust' Gertrude Jekyll (1843-1932). This study carried out by the researcher for Al-Bukhary

* Corresponding author. Tel.: +6-03-7967-5398; fax: +6-03-7967-5713.
E-mail address: reenalambina@um.edu.my.

International University in collaboration with Malik Lip & Associates aims to improve the outdoor environment on school grounds, focusing on sensory gardens as an educational resource to demonstrate how students' attitudes, behaviours and learning skills could be enriched. Specifically, this study would explore the intentions of, and the design process undertaken by practitioners and the main challenges that they had to deal with in accomplishing a well-designed sensory garden that would fulfill users' needs. In order to meet those needs, practitioners should understand how these users behave, use and engage with the garden features. During the preliminary site studies (explained in the literature review section), the researcher had discovered that there are many precedents set for sensory environments; however, there was not much thought given to the design of these environments. Thus, the environment and behavior research should be in demand that include systematic investigation of the relationships between the environment and human behaviour, and their implication in the design of sensory gardens.

Sensory garden is a self-contained area, which focuses on a variety of sensory experiences. Such as area, if designed, maintained and managed well, offers a positive resource that caters for a variety of users, from education to recreation. Taking into account the sensory element (hard and soft landscaping, colours, textures) as the key factor in designing for these gardens, they are to draw the users into touch, smell and actively experience the garden with all senses. Currently, research into sensory garden design, focusing on children with exceptional needs is still new in the context of Malaysia. Here, the research collaboration learn further from the successes and failures of the case studies selected in the United Kingdom, whilst sharing its own experiences, so as to improve the design of sensory gardens in Malaysia in the future. The research paper has also informed the ongoing construction of the first sensory garden, named 'Syarifah Rokiah Knowledge Centre' in Al-Bukhary International University, Kedah as an effort to provide a multi-sensory environment for learning.

2. Literature review

Historically, sensory gardens have evolved gradually from the traditional concept of a 'garden for the blind' to sensory landscapes (Hussein, 2011). According to Hussein (2009a), the idea is to integrate green areas that will encourage sensory stimulation, physical mobility and social skills. Other researchers added that the integration of green areas also contribute towards health improvements (Vries, 2010), environmental education (Building Bulletin 102, 2008), emotional growth (Maller and Townsend, 2006) and mental development (Maller and Townsend, 2006), rather than making 'special' provision for disabled people. 'Multi-sensory environment' (Pagliano, 1999), focusing on sensory gardens raised a number of preliminary questions: Are not all gardens sensory? Of what is a sensory garden composed? How do people use the sensory gardens? The initial research undertaken by Hussein (2009a) involved understanding a review of existing literature on these gardens. The review revealed a lack of rigorous research on the subject, so the best approach would be to conduct preliminary site studies, mainly visiting places that claim to have sensory gardens. The researcher carried out preliminary interviews with key experts, practitioners, teachers and therapists, followed by observations of how children with specific educational needs used these gardens. This fieldwork would support the selection of case studies and help prepare for observation and interview process, which would take place at the data collection stage. Of the fourteen, sensory gardens visited, eight designed by practitioners and six created via community or school effort. One of these is health-care centre for adults; another is a primary school, and one other is accessible to the public. The rest are special schools, which cater for students with specific educational needs. There are three main issues that arose from the preliminary site studies: Firstly, concerns the design. Often, a creator's biggest mistake is in presuming that he or she knows what the needs of the users. For example, while a creator may be aware that water is a significant feature of a garden – in that it appeals to a user's senses of hearing and touch – in some sensory gardens, the water is not easily

accessible; therefore the feature might not be inaccessible to some users. This excludes certain users from sections of the garden, and may leave them unable to access some of the features. Secondly, the issue associates with the maintenance of sensory gardens. Gardens that fail to be maintained during the years following their creation will decrease in terms of their sensory impact and, therefore, will not entice people to visit. Thirdly, relates to the lack of design guidelines for sensory gardens.

Why do problems still exist in sensory gardens even though they designed by practitioners? The researcher conducted an interview with Jane Stoneham, the Director of Sensory Trust and author of the book, 'Landscape Design for Elderly and Disabled People'. Stoneham stated that although there are many publications on multi-sensory environments, for example, Snoezelen (Cavet and Mount, 1995) and anthropometrics (Harris and Dines, 2005); the design of sensory gardens currently relies on the experience and the attitude of creators. This idea supported interviews with practitioners, Robert Petrow of Petrow Landscape Architect, John Mathias of the Hidden Garden, Sue Robinson of Stockport Metropolitan Borough Council, Mark Boothroyd of Groundwork Wirral and Nik Malik Nik Zainal Abidin of Malik Lip & Associates. They note that there is a lack of detailed guidelines available when designing sensory gardens for people with special needs.

3. Methodology

This research constructed a methodology based on Moore and Cosco's research (2007) on inclusive parks. The researcher further developed it in the context of a sensory garden. She interviewed practitioners and school staff in two selected case-studies in the United Kingdom, followed by detailed observation data of how the special schooled children used the sensory gardens. She demonstrated that they are applicable and can be used effectively in a British context. An identified potential case-study at the Al-Bukhary International University is currently constructing the first sensory garden in Malaysia. The researcher conducted an interview with the practitioner who designed the garden. However, the observation data could not be obtained until the full completion and operation of the sensory garden. For the purpose of this paper, the data collection explained based on the two case-study sites: Royal School for the Deaf and Communication Disorders in Manchester and Lyndale School, in Liverpool.

The data collection started with an interview with the practitioner, conducted over two sessions. Firstly, at a place of the practitioner's choosing. This was to find out the main challenges that practitioners had to deal with, intentions of, and the design process undertaken by them. The first interview also assessed whether users utilized areas and features in the way that they intended to do by the practitioner. Secondly, involved a walk-through of the sensory garden. This was to gather further explanation, in terms of the environmental qualities to a detailed specification. Subsequently, the researcher conducted interviews with teachers and therapists to explore the benefits in having a sensory garden as part of a school's education facility.

After the in-depth interviews have completed, the researcher undertook observation of on-site activities. She conducted this data collection in May and July, for seven consecutive working days each month. The chosen period of observation was to ensure that the daily variations in behaviour could be observed. Then the data recorded continuously from 8.30am to 3.30pm on weekdays, for during the opening hours of the school term.

There are three research limitations in the methodology. Firstly, the walk-through interviews with students were not undertaken extensively. The researcher found it was particularly difficult to get first-hand information from them because of the communication difficulties; thus she observed them using the sensory garden by behavioral mapping method. Secondly, was the duration of data collection. The actual period of data collection for the two special schools was just five weeks to coincide with the school term periods. Furthermore, the researcher thought the months of May and July offered the best outdoor

conditions in the United Kingdom. Other research into multi-sensory environments carried out over substantially longer periods. Long and Haigh (1992) have a pre-pilot period of two months, followed by observation over a six months period. Thirdly, similar methodology could be further explored in a Malaysian context. To date, the researcher only conducted one session of the interview with the practitioner who designed the 'Syarifah Rokiah Knowledge Centre' in Kedah as its garden is under construction. However, the interview result can be used to fulfill part of the research objectives. Further investigation scheduled to be carried out upon the completion of the sensory garden.

4. Findings

The sensory garden of Royal School of the Deaf and Communication Disorders (RSDCD), named the 'Multi-Sensory Millenium Maze' designed in 2000 by Sue Robinson, a practitioner from Stockport Metropolitan Borough Council (see Fig.1). According to Robinson, she had done prior research, including having close collaboration with staff and students. She also carried out site survey and analysis. The key principles are to create a multi-sensory garden, which would cater for a wide variety of user capability; to offer an attractive location to young people whilst providing varied sensory perceptions and good educational value. The design objectives were to offer 'everyday experiences', to provide a variety of different forms, textures, colours, shade, touch and sound' to accommodate access from all directions to this centrally located site; to achieve maximum potential by providing a series of linked mini gardens. The main challenge was to design for and accommodate an extensive range of user capabilities and needs.

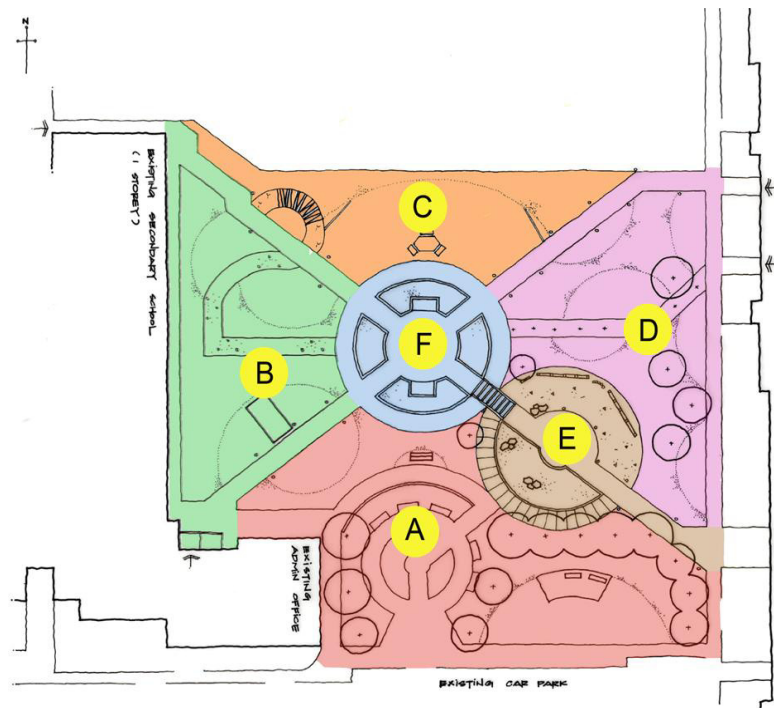


Fig. 1. Plan of the sensory garden, showing the zones of the RSDCD

Legend: Zone A (Parents' Waiting Area), Zone B (Exploraway), Zone C (Green Space 1), Zone D (Green Space 2), Zone E (Asteroids Arts garden), Zone F (Water Central Area)

The planning and design work of the sensory garden in Lyndale School (LS) prepared and completed in September 2005 by a practitioner, Mark Boothroyd of Groundwork Wirral (see Fig.2). Similar to the first case study, Boothroyd had also done prior research, including having a consultation with the school community. During the design stage, collage work with staff and students in the school produced to show the outdoor environment they wanted. The key principles are to transform the sloping grounds into a stimulating environment where the children could explore, with some degree of independence, allowing for maximum enjoyment to enhance their learning experience through natural features. The design objectives were to make the area accessible; to maximize the potential of the site and highlight the principles that govern the indoors to the outdoor environment. The main challenges were to accommodate the ambition to have a sensory garden on a limited fund as well the technical use of a water feature and maintenance in general. The practitioner also needed to develop an understanding of the needs of users as the scope of this work ranged from a conceptual development to the master plan.

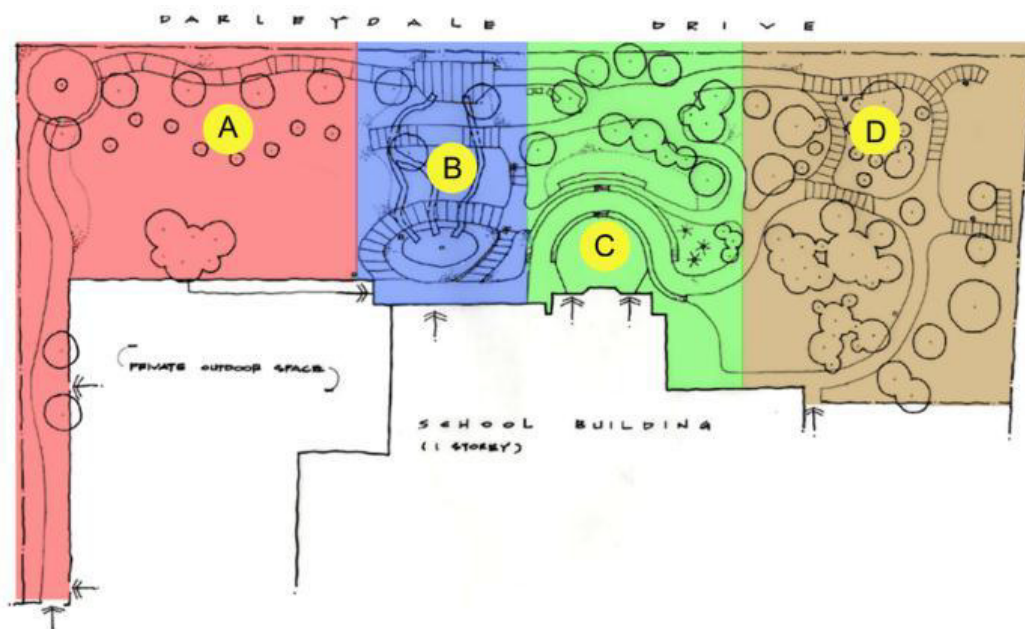


Fig. 2. Plan of the sensory garden, showing the zones of the LS

Legend: Zone A (Rainbow Walk), Zone B (Water Garden), Zone C (Green Space), Zone D (Woodland Garden)

The interview results: Practitioners of the two schools' garden agreed on the same design aspects that encourage the use of the area in a sensory garden. These are users' accessibility, aesthetic value, maintenance, planting, the quality of sensory equipment (hard and soft), safety and the spatial location of the garden in relation to the site context. The practitioner of the potential case-study in Malaysia also agreed with this. Meanwhile, the teachers and therapists in both schools concurred with many of these aspects, highlighting that users' accessibility, maintenance, planting, the quality of sensory equipment (hard and soft), safety and the spatial location of the garden may greatly enable the use of the area. However, unlike the practitioners, half of these respondents held no firm views on how the aesthetic value relates to the use of the area in the garden. This was because some of their students were partially sighted and visually impaired.

The observation results: It was surprising to discover that students of both schools use the sensory gardens in all types of weather. For example, on every day of the observation period at the RSDCD, one student (who is a wheelchair user) and her teaching assistant would use the sensory garden for between 30 minutes and an hour from midday. No matter whether it was a sunny, rainy or windy day, she would be wheeling in the garden. Another notable incident took place at the LS when a young boy and his teaching assistant were taking a leisure stroll in the sensory garden. As they reached the boardwalk underneath a shady canopy, the assistant jumped up and grabbed a branch. The boy looked at her, obviously puzzled as to why she had done that. ‘I have a surprise for you... are you ready?’ she asked as he held the rope railing and jumped with excitement. Keeping a good grip of the branch, the assistant shook it hard, causing drops of rainwater to fly from the leaves. The boy was so surprised that he let go of the rope railing, lifted his arms and turned his face to the sky so he could feel the water falling on it. At a time, he even opened his mouth to taste it. This simple setting enabled the teaching assistant and student to laugh together as they both got wet. It proved the point that sometimes the simplest ideas are the best. From the observation results, it showed that the layout of the circulation network enables user behaviour and use of the area. Users also spent a longer time in areas where sensory were emphasised, rather than aesthetic value.

5. Analysis and discussion

There was a notable difference between how the practitioners, teachers and therapists anticipated users would behave and what was recorded during the observation periods. Some of the similarities and differences summarized based on the two case-studies, as follows:

5.1. Royal School of the Deaf and Communication Disorders

Both sets of results (interview and observation) suggested that well-designed and well-planned paths are highly significant and would lead to high usage. A good pathway network should provide clear links between school buildings and the garden, and should enable easy circulation (see Fig. 3).



Fig. 3. Accessibility and variety of pathways

Many interviewees thought that planted shrubs around a water feature acted as a barrier between the user and the feature. In practice, though, many users were still able to enjoy this feature, and they spent a

lot of time doing so. Interestingly, it was not initially designed to be surrounded by shrubs, but to be a smooth, reflective steel dome with water flowing over it. However, the inclusion of shrubs does not seem to have affected the level of usage (see Fig. 4).



Fig. 4. Water feature at the Water Central Area (zone F)

Both the interviews and observations results suggested that the least used features were the Exploraway and the Vaporized Trail (see Fig. 5) at Green Space 2 (zone C). This is due to the unsuitability of the surface material for many users. The practitioner was not involved at the detailed design and construction stage. Therefore, she had not envisaged that the Vaporised Trail would be laid with large stone blocks. However, although she assumed that these are difficult for users to utilize, in reality, some users seen stepping on and over the blocks as they passed through the garden. Ironically, the Exploraway – so called because the practitioner originally intended for its surface to be much bumpier – offers less of a challenge than the other paths.



Fig. 5. (a) The Exploraway; (b) The Vaporized trail

The practitioner predicted that this zone would be the most popular and the observation results confirmed this to a certain extent. However, the teachers and therapists said they thought the musical instruments were inaccessible, lacked variety and did not motivate users because the feature does not make any sound (see Fig. 6).



Fig. 6. Musical instruments in the Asteroid Arts Garden (zone E)

The teachers and therapists stated that the raised planters were inaccessible to students who were wheelchair users; they thought the width of the planters made it difficult to reach the plants (see Fig. 7). In contrast, though, during the observation period, while students on specially-adapted bicycles were passing by the garden, they were also touching the moss on this feature. In fact, this proved to be the most popular feature in terms of the average time spent there by users.



Fig. 7. Raised planters at the Water Central Area (zone F)

5.2. Lyndale School

Both sets of results showed that area and features that used the least were the pathway and slope. Wheelchair users found their exploration interrupted by the sudden ending of the path at the Water Garden (zone B). Although many students appreciated the sound stimuli at the end of the boardwalk at the Woodland Garden (zone D), this caused them to linger, creating a bottleneck of users in one area. For those who want to pass through, this hamper the circulation (see Fig. 8).



Fig. 8. (a) Path network; (b) Path circulation that does not allow a steady flow of users.

The practitioner and teachers thought that the water feature was the most successful in terms of frequency of use. However, the observation results showed that this feature had the second lowest number of users. This is probably due to the slippery surface at the boardwalk, and inaccessible raised beds (see Fig. 9).



Fig. 9. Water feature at the Water Garden (zone B)

6. Conclusions and recommendations

Pathway layout has a strong bearing on users' behaviour and use of the area in the sensory garden. Where a pathway network links the garden to the rest of the areas in an effective manner, it provides users with easy access to the functional features that placed along it. Well thought pathway circulations will encourage more users to enjoy the benefits of a sensory garden. This finding echoed research on inclusive parks undertaken by Moore and Cosco (2007), which showed that a highly positive feature and one was the most popular among the users, was a wide pathway that gave access to the facilities that were readily accessible.

Areas that focus on sensory rather than aesthetic appear to attract the greatest number of users and these users tend to spend longer time here than in other zones. Thus, to identify and suggest how 'sensory value' could be integrated into design theory and implemented in practice, would be a useful contribution to new knowledge. What practitioners should be designing is something more like a 'sensory trail'. The fact that users can get access to and engage with the features is the key point when designing for these gardens. It is more to do with where the features sited rather than what they are.

This research has raised some valuable points concerning the assumptions that many people make about sensory gardens. There was often a stark difference between what the practitioners and teachers thought would be popular and what worked well in reality. Assumptions about what users enjoy and how they engage with their environment, clearly sometimes very misleading. Practitioners should visit existing sensory environments to observe the usage before starting a project (Farrer, 2008), to help them understand the engagement that occurs between users and their surrounding environment (Nebelong, 2008), which features are most successful. The results have shown that even the teachers and therapists who see their pupils on a daily basis, sometimes make incorrect assumptions. While their comments and opinions are valuable, there is no substitute for observing how users behave. Of course, practitioners have limited time to set observing these environments, which brings us to the final point: the need for solid best practice guidance on sensory gardens. Only once we have well-researched, reliable design guidance on these environments will start to see the standard of sensory gardens raised to a consistently high level.

New directions for further research exploration scheduled at the Al-Bukhary International University in Kedah, Malaysia where the first sensory garden is undergoing construction. It would be interesting to examine the use in a Malaysian context. This would produce distinct research on the design of these gardens. Thus, the result of future research would produce further knowledge into how the composition of the features and the spatial design of the sensory garden would enable users' engagement and usability of the garden. Thus, additional recommendations and improvements for future use, planning and the design of sensory gardens in special schools could be suggested.

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